



OCT 11 2001
REMARKS
TECHNOLOGY CENTER 2800

The application has been carefully reviewed in light of the Office Action dated July 9, 2001. Applicants gratefully acknowledge the Examiner's statement that claims 4-8, 10-12, 16-21, 27 and 28 contain allowable subject matter. Claim 22 has been amended. Claims 1-30 are still pending.

Figures 8(a) and 8(b) stand objected to for not having a "Prior Art" label. Figures 8(a) and 8(b) have been amended in response to the objection per the Request for Approval of Drawing Correction being filed concurrently herewith. Favorable reconsideration and withdrawal of the objection is respectfully requested.

Claims 9-15, 22-24 and 26-30 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Applicants respectfully traverse the rejection and request reconsideration.

A claim is indefinite when it contains words or phrases whose meaning is unclear. MPEP § 2173.05(e). The meaning of claim 9, however, is clear in that it recites, at lines 5-6, "each of said second set of delay cells receiving a delayed output signal produced by one of said first set of delay cells." Applicants respectfully request reconsideration and withdrawal of the rejection. Since claims 10-15 depend (either directly or indirectly) on claim 9, Applicants also respectfully request reconsideration of these claims and withdrawal of their rejection.

Claim 22 has been amended to address the rejection and is in compliance with 35 U.S.C. § 112. Claims 23 and 24, dependent on claim 22 (either directly or indirectly) are also in compliance with 35 U.S.C. § 112. As for claims 26-30, their respective preambles simply repeat the preamble of independent claim 25, from which they depend (either directly or indirectly), and, thus, derive their antecedent basis from claim 25. Since

the meaning of claims 26-30 is not unclear, the claims are in compliance with 35 U.S.C. § 112.

Regarding claims 29 and 30, the Office Action does not set forth how the language of the claims is ambiguous, vague, or otherwise unclear. As the language plainly describes, the operation of the “individually controlling” step is based on “different channel output signals” as in claim 29, and, more particularly, based on “different combinations of channel output signals,” as in claim 30. One illustrative embodiment of these claims can be seen in the calibration loops described at page 9, line 12 through page 11, line 23, and shown in Figure 6. As the language of claims 29 and 30 has not been shown to be “unclear” in its meaning, the rejection of these claims should be reconsidered and withdrawn.

Claims 1-3, 9, 13, 25 and 26 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Meyer (U.S. Patent No. 5,448,191). Applicants respectfully traverse the rejection and request reconsideration.

Claim 1 recites a signal generator for generating a plurality of output signals at a plurality of respective time intervals and “a plurality of time interval control units regulating the respective time intervals,” wherein “said plurality of time interval control units individually control the respective time intervals between the plurality of output signals so as to produce substantially uniform time spacing between each of the output signals.”

Meyer, to the contrary, fails to anticipate (or suggest) a signal generator having these limitations. Meyer merely discloses a frequency synthesizer that provides a synthesized signal by selecting (through a multiplexer) one of a plurality of output signals NF1, NF2, NF3 (Meyer at Fig. 5; column 4, lines 42-48; column 5, line 66 to column 6, line 20). Meyer makes no mention, however, of controlling the time intervals between the output signals NF1, NF2, NF3. That is, nowhere does Meyer mention or even suggest

that the respective time intervals between signals NF1, NF2, NF3 are to be controlled, as required in claim 1. Nor does Meyer disclose (or suggest) a “plurality of time interval control units individually [controlling] the respective time intervals between the plurality of output signals so as to produce substantially uniform time spacing between each of the plurality of output signals,” as required in claim 1. Indeed, Meyer does not even recognize a problem in the art with non-uniform time spacing, much less anticipate (or suggest) a solution. Instead, the objective of Meyer is to reduce the jitter of output signal NF by selecting one of the signals NF1, NF2, NF3 whose phase most closely resembles the desired phase for output signal NF. Meyer is not used to individually control, with time interval control units or otherwise, the time intervals between signals NF1, NF2 and NF3 (i.e., the relative phases of signals NF1, NF2, NF3) so as to produce substantially uniform time spacing between each of the signals NF1, NF2 and NF3, as required in claim 1. Meyer, therefore, discloses nothing to anticipate (or render obvious) the invention as recited in claim 1.

Similarly, claim 9 recites “a second set of delay cells” respectively coupled to ones of “a first set of delay cells,” wherein “each of said second set of delay cells receives a unique control signal for controlling the timing of [a] channel output signal output by each of said second set of delay cells.” As stated above in connection with claim 1, Meyer does not anticipate (or suggest) any mechanism for controlling the timing of a channel output signal, much less one utilizing a unique control signal for each of a second set of delay cells, as required in claim 9.

Much like claim 1, claim 25 recites a method of providing clock signals having the steps of “outputting a series of channel output signals in response to respective ones of [a] series of delayed output signals,” and “individually controlling the output of each of the series of channel output signals to produce precise timing of each channel output signal output in said outputting step.” As stated above with respect to claim 1, Meyer does not anticipate (or suggest) any mechanism for controlling timing of output signals, much less

anything that “individually [controls] the output of each of [a] series of channel output signals to produce precise timing of each channel output signal,” as defined in claim 25.

As nothing in Meyer anticipates (or renders obvious) Applicants’ claimed invention as defined in independent claims 1, 9, and 25, the rejection of these claims should be reconsidered and withdrawn. As claims 2, 3, 13 and 26 all depend (directly or indirectly) on either claim 1, 9 or 25, the rejection of claims 2, 3, 13 and 26 should be reconsidered and withdrawn for the same reasons given above.

Applicants further submit that claims 2, 3, 13 and 26 recite additional limitations not anticipated (or rendered obvious) by Meyer. Claims 2 and 3, for example, further recite “a plurality of output buffers” and a “first plurality of delay cells.” Claim 13 further recites that “each of said first set of delay cells is associated with at least two delay cells of said second set of delay cells.” Claim 26 further recites “individually controlling the output of each of the series of channel output signals to produce a series of uniformly spaced clock signals.”

Claims 14 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Meyer. Claim 14, dependent on claim 9, further recites “a set of output buffers . . . respectively coupled to one of the delay cells in said second set of delay cells.” Claim 15, also dependent on claim 9, further recites that “the time-interleaved architecture is within an integrated electronic system permitting real-time calibration of the channel output signals output by said second set of delay cells.” Claims 14 and 15 are allowable at least for those reasons described above, with respect to claim 9, and also because Meyer does not teach or suggest their respective inventive combinations.

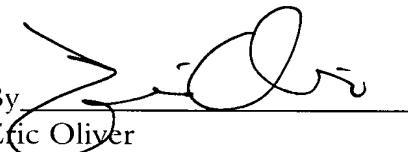
Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned “Version with Markings to Show Changes Made.”

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the outstanding rejections of the claims and to pass this application (with claims 1-30) to issue.

Applicants hereby petition for any extension of time which may be necessary to have this Amendment considered. Applicants hereby authorize the Commissioner to debit our Deposit Account No. 04-1073 (under Order No. I9000.0045/P045) for any fees deemed necessary for this purpose.

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Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE
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In the Claims:

Please replace claim 22 with amended claim 22 below:

22. (Amended) A method of calibrating a plurality of channel output signals of a multi-phase clock generator having a first plurality of delay cells paired with at least one of a plurality of output buffers, and a second plurality of delay cells respectively receiving [channel] output signals from the first plurality of delay cells and outputting the channel output signals to respective ones of the plurality of output buffers, the method comprising the steps of:

phase aligning a first one of the plurality of channel output signals to an external reference clock; and

individually controlling respective ones of the second plurality of delay cells to individually delay output of the channel output signals to respective ones of the plurality of output buffers.